ASA-1151

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

    M. ASANO et al

Serial No. 10/650,851   Group Art Unit: 2161

Filed: August 29, 2003   Examiner: S. Metjahic

For: STORAGE OPERATION MANAGEMENT PROGRAM AND
     METHOD AND A STORAGE MANAGEMENT COMPUTER

RESUBMITTED PETITION TO MAKE SPECIAL
UNDER 37 CFR §1.102(d) (MPEP §708.02(VIII))

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450   May 19, 2005

Sir:

In response to the Decision on Petition to Make Special

mailed March 21, 2005, dismissing the Petition to Make Special

filed November 12, 2004, the Applicants re-petition.

This Resubmitted Petition incorporates by reference the

November 12, 2004 Petition and provides additional details

regarding the claims and how this claimed subject matter is

patentable over the documents developed by the pre-examination

search.

The Applicants have prepared this Resubmitted Petition in

order to satisfy the requirements of 37 CFR 1.102(d) and MPEP

§708.02 (VIII), and to address the deficiencies alleged in the

Decision noted above (namely, the lack of a sufficiently

detailed discussion of the documents developed by the pre-examination search, including a detailed discussion of the Watanabe document that distinguishes the features of Claims 7 and 15; a detailed discussion of the Matsunami and Soejima documents that distinguishes the features of Claims 1, 3, 6, 7, 9, 11, 14, and 15; and a more particularized discussion directed to how the language of each of the independent claims is specifically distinguishable and patentable from each document). Thus, the Applicants below refer to specific claim language in accordance with the requirement, while attempting to avoid a wholesale restatement of the independent claims. Nevertheless, to achieve the required specificity, and due to the relative lack of correspondence between the claimed structure/functions and the listed disclosures, substantial restatement of the claims could not be entirely avoided.

In accordance with the requirements set forth in Manual of Patent Examining Procedure §708.02(VIII), the Applicants believe that all claims are directed to a single invention. If the Office determines that all claims are not directed to a single invention, the Applicants will make an election without traverse as a prerequisite to the grant of special status.

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Discussion of invention as claimed in the independent claims

The claimed invention, as set forth in independent Claims 1, 3, 6, 7, 9, 11, 14, 15, and 17, is generally directed to operating or managing replication of a data area inside a storage or among a plurality of storages.

Claim 1 recites a storage operation management program according to which a request for generating a replication destination data area for a replication data source area is accepted, a data area capable of configuring the replication destination concident with properties of a data area corresponding to a policy of the replication source data area is retrieved from existing data areas, and the storage is instructed to generate a replication pair of the data area. Claim 9 is directed to a storage operation management method, including steps similar to those performed according to the storage operation management program of Claim 1.

Claim 3 recites a storage operation management program according to which information of a designated data area is acquired, a data area of a replication destination is generated in accordance with information of a data area of a replication source when the data area of the replication destination different from the data area of the replication source is set with the data area being the data area of the

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replication source, the data area of the replication

destination is selected in accordance with the information of

the data area of the replication source, and the data area of

the replication destination is managed as the replication

destination of the data area of the replication source. Claim

11 is directed to a storage operation management method

including steps similar to those carried out according to the

storage operation management program of Claim 3. Claim 17

recites a managing computer including means for carrying out

functions which are similar to the steps performed according

to the program of Claim 3 and the method of Claim 11.

Claim 6 is directed to a storage operation management

program according to which information of managed data areas

is acquired, information of a route for connecting a storage

having a data area of a replication source (hereinafter,

"first data area") and a storage having a data area of a

replication destination (hereinafter, "second data area") when

replication is operated with one of the data areas as the

first data area and another as the second data area,

information of the route is confirmed when write occurs to the

first data area, information of the route is confirmed in

response to a replication start request from the first data

area to the second data area, whether a connection of the

route is made through a different route is judged in response
to information of the first data area and information of a
line, and an instruction of replication of the first data area
to the second data area is given to the storage by connecting
the different route. Claim 14 is directed to an operation
management method including steps similar to those carried out
according to the storage operation management program of Claim
6. However, Claim 14 includes a step of establishing
connection through the different route and making replication
from the first data area to the second data area, whereas the
program of Claim 6 includes a step of giving the storage an
instruction of replication of the first data area to the
second data area.

Claim 7 is directed to a storage operation management
program according to which an operation condition of a
replication operation is acquired when the replication is
operated with respect to the first data area and the second
data area; existence/absence of omission of data stored in a
storage area is judged in accordance with information of the
first data area, the operation condition of the replication,
and the operation condition of the storage area; and data of
the storage area acquiring updating data is updated in
accordance with the judgment. Claim 15 is directed to a

storage operation management method including steps similar to those carried out according to the program of Claim 7.

Discussion of documents developed by pre-examination search

A pre-examination search has been conducted in the following areas: Class 707, subclass 204; and Class 711, subclasses 100, 154, 161, and 162. A key word search was also performed on the USPTO full-text database, including published U.S. patent applications.

Of the documents reviewed during the search, those deemed to be most closely related to the subject matter encompassed by the claims are listed and discussed below. The claimed subject matter is believed to be patentable over the teachings of these documents for the reasons set forth. One copy of each of these documents was submitted with the Petition filed November 12, 2004.

U.S. Patents

6,681,303 B1   Watanabe, et al.

U.S. Patent Application Publications

2002/0099914 A1   Matsunami, et al.
2003/0074528 A1   Soejima, et al.
2003/0188114 A1   Lubbers, et al.
2003/0204597 A1   Arakawa, et al.
2003/0233518 A1   Yamagami, et al.

The patent to Watanabe, et al. (US 6,681,303) ("Watanabe") is directed to a storage system designed to improve remote copying, reduce the size of a copy destination storage area, and shorten the time required for migratory copying by generating a copy of only such areas that need to be copied. A request for remote copy pair generation accompanied with parameters including emulation type, capacity of logical volume, and the area made the object of remote copying, is issued from one controller to another.

Watanabe, however, does not disclose retrieval of a data area capable of configuring the replication destination coincident with properties of a data area corresponding to a policy of the replication source data area from existing data areas, as claimed in Claims 1 and 9. Further, Watanabe does not disclose the generation of a data area of a replication

destination in accordance with information of a data area of a

replication source when the data area of the replication

destination different from the data area of the replication

source is set with the data area being the data area of the

replication source, selection of the data area of the

replication destination in accordance with information of the

data area of the replication source, or management of the data

area of the replication destination as the replication

destination of the data area of replication source, as

required by Claims 3, 11, and 17.

In addition, Watanabe does not disclose a program/method

that acquires information of a route for connecting a storage

having the first data area (of a replication source) and a

storage having the second data area (of a replication

destination) when replication is operated with one data area

as the first data area and another data area as the second

data area, confirms information of the route when write occurs

to the first data area, confirms information of the route in

response to a replication start request from the first data

area to the second data area, and judges whether connection of

the route for connecting the first data area to the second

data area is made through a different route in response to

information of the first data area and information of a line,

as required by Claims 6/14. Further, Watanabe does not disclose a program that gives the storage and instruction of replication of the first data area to the second data area by connecting the different route, as required by Claim 6, or a method that establishes connection through the different route and makes replication from the first data area to the second data area, as required by Claim 14.

Moreoever, Watanabe does not disclose a program/method that acquires an operation condition of the replication operation when the replication is operated with one of the data areas as the first data area and another data area as the second data area; judges existence/absence of omission of data stored in a storage area in accordance with information of the first data area, the operation condition of the replication, and the operation condition of the storage area; and updates data of the storage area acquiring updating data area in accordance with the judgment, as required by Claims 7/15.

The patent application publication to Matsunami, et al. (2002/0099914) ("Matsunami") is directed to a method for realizing storage pool management without forming beforehand logical unit numbers for a storage pool area. Matsunami discloses a method of creating a storage area, including a step of setting a logical storage area to a storage connected

to a management terminal via a network in accordance with

information on the storage and information on the logical

storage area. When a volume is formed, a policy is designated

to select a storage area having a corresponding attribute from

the pool area in the storage.

Matsunami, however, does not disclose retrieval of a data

area capable of configuring the replication destination

coincident with properties of a data area corresponding to a

policy of the replication source data area from existing data

areas, as claimed in Claims 1 and 9. Further, Matsunami does

not disclose the generation of a data area of a replication

destination in accordance with information of a data area of a

replication source when the data area of the replication

destination different from the data area of the replication

source is set with the data area being the data area of the

replication source, selection of the data area of the

replication destination in accordance with information of the

data area of the replication source, or management of the data

area of the replication destination as the replication

destination of the data area of replication source, as

required by Claims 3, 11, and 17.

In addition, Matsunami does not disclose a program/method

that acquires information of a route for connecting a storage

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having the first data area (of a replication source) and a
storage having the second data area (of a replication
destination) when replication is operated with one data area
as the first data area and another data area as the second
data area, confirms information of the route when write occurs
to the first data area, confirms information of the route in
response to a replication start request from the first data
area to the second data area, and judges whether connection of
the route for connecting the first data area to the second
data area is made through a different route in response to
information of the first data area and information of a line,
as required by Claims 6/14. Further, Matsunami does not
disclose a program that gives the storage and instruction of
replication of the first data area to the second data area by
connecting the different route, as required by Claim 6, or a
method that establishes connection through the different route
and makes replication from the first data area to the second
data area, as required by Claim 14.

Moreoever, Matsunami does not disclose a program/method
that acquires an operation condition of the replication
operation when the replication is operated with one of the
data areas as the first data area and another data area as the
second data area; judges existence/absence of omission of data

stored in a storage area in accordance with information of the first data area, the operation condition of the replication, and the operation condition of the storage area; and updates data of the storage area acquiring updating data area in accordance with the judgment, as required by Claims 7/15.

The patent application publication to Soejima, et al. (2003/0074528) ("Soejima") is directed to volume management, including a method of receiving a volume creation request specifying a requested storage capacity and requested average performance by a management computer. A judgment is formed as to whether there exists an unoccupied area satisfying the requested storage capacity. If such an area exists, a further judgment is made as to whether any of those areas have the requested average performance.

Soejima, however, does not disclose retrieval of a data area capable of configuring the replication destination coincident with properties of a data area corresponding to a policy of the replication source data area from existing data areas, as claimed in Claims 1 and 9. Further, Soejima does not disclose the generation of a data area of a replication destination in accordance with information of a data area of a replication source when the data area of the replication destination different from the data area of the replication

source is set with the data area being the data area of the replication source, selection of the data area of the replication destination in accordance with information of the data area of the replication source, or management of the data area of the replication destination as the replication destination of the data area of replication source, as required by Claims 3, 11, and 17.

In addition, Soejima does not disclose a program/method that acquires information of a route for connecting a storage having the first data area (of a replication source) and a storage having the second data area (of a replication destination) when replication is operated with one data area as the first data area and another data area as the second data area, confirms information of the route when write occurs to the first data area, confirms information of the route in response to a replication start request from the first data area to the second data area, and judges whether connection of the route for connecting the first data area to the second data area is made through a different route in response to information of the first data area and information of a line, as required by Claims 6/14. Further, Soejima does not disclose a program that gives the storage and instruction of replication of the first data area to the second data area by

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connecting the different route, as required by Claim 6, or a method that establishes connection through the different route and makes replication from the first data area to the second data area, as required by Claim 14.

Moreoever, Soejima does not disclose a program/method that acquires an operation condition of the replication operation when the replication is operated with one of the data areas as the first data area and another data area as the second data area; judges existence/absence of omission of data stored in a storage area in accordance with information of the first data area, the operation condition of the replication, and the operation condition of the storage area; and updates data of the storage area acquiring updating data area in accordance with the judgment, as required by Claims 7/15.

The patent application publication to Lubbers, et al. (2003/0188114) ("Lubbers") is directed to data replication with virtualized volumes. To create a copy set, a user designates a virtual disk as source and a site storage cell as destination. In response to a query for compatible storage cells, storage cells that can support data replication management (DRM) operations are presented to a user for identification and selection as destinations, although "[i]t is contemplated that the system could automatically select a

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storage cell to host the replica rather than enabling user selection."

Lubbers, however, does not disclose retrieval of a data area capable of configuring the replication destination coincident with properties of a data area corresponding to a policy of the replication source data area from existing data areas, as claimed in Claims 1 and 9. Further, Lubbers does not disclose the generation of a data area of a replication destination in accordance with information of a data area of a replication source when the data area of the replication destination different from the data area of the replication source is set with the data area being the data area of the replication source, selection of the data area of the replication destination in accordance with information of the data area of the replication source, or management of the data area of the replication destination as the replication destination of the data area of replication source, as required by Claims 3, 11, and 17.

In addition, Lubbers does not disclose a program/method that acquires information of a route for connecting a storage having the first data area (of a replication source) and a storage having the second data area (of a replication destination) when replication is operated with one data area

as the first data area and another data area as the second
data area, confirms information of the route when write occurs
to the first data area, confirms information of the route in
response to a replication start request from the first data
area to the second data area, and judges whether connection of
the route for connecting the first data area to the second
data area is made through a different route in response to
information of the first data area and information of a line,
as required by Claims 6/14. Further, Lubbers does not
disclose a program that gives the storage and instruction of
replication of the first data area to the second data area by
connecting the different route, as required by Claim 6, or a
method that establishes connection through the different route
and makes replication from the first data area to the second
data area, as required by Claim 14.

Moreoever, Lubbers does not disclose a program/method
that acquires an operation condition of the replication
operation when the replication is operated with one of the
data areas as the first data area and another data area as the
second data area; judges existence/absence of omission of data
stored in a storage area in accordance with information of the
first data area, the operation condition of the replication,
and the operation condition of the storage area; and updates

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data of the storage area acquiring updating data area in accordance with the judgment, as required by Claims 7/15.

The patent application publication to Arakawa, et al. (2003/0204597) ("Arakawa") discloses a storage system having a server that creates and manages a replication of a logical volume or virtual volume in another storage subsystem. Arakawa determines the suitability of a storage area as a destination storage area based on size and attributes of the candidate destination storage area.

Arakawa, however, does not disclose retrieval of a data area capable of configuring the replication destination coincident with properties of a data area corresponding to a policy of the replication source data area from existing data areas, as claimed in Claims 1 and 9. Further, Arakawa does not disclose the generation of a data area of a replication destination in accordance with information of a data area of a replication source when the data area of the replication destination different from the data area of the replication source is set with the data area being the data area of the replication source, selection of the data area of the replication destination in accordance with information of the data area of the replication source, or management of the data area of the replication destination as the replication

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destination of the data area of replication source, as required by Claims 3, 11, and 17.

In addition, Arakawa does not disclose a program/method that acquires information of a route for connecting a storage having the first data area (of a replication source) and a storage having the second data area (of a replication destination) when replication is operated with one data area as the first data area and another data area as the second data area, confirms information of the route when write occurs to the first data area, confirms information of the route in response to a replication start request from the first data area to the second data area, and judges whether connection of the route for connecting the first data area to the second data area is made through a different route in response to information of the first data area and information of a line, as required by Claims 6/14. Further, Arakawa does not disclose a program that gives the storage and instruction of replication of the first data area to the second data area by connecting the different route, as required by Claim 6, or a method that establishes connection through the different route and makes replication from the first data area to the second data area, as required by Claim 14.

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Moreoever, Arakawa does not disclose a program/method that acquires an operation condition of the replication operation when the replication is operated with one of the data areas as the first data area and another data area as the second data area; judges existence/absence of omission of data stored in a storage area in accordance with information of the first data area, the operation condition of the replication, and the operation condition of the storage area; and updates data of the storage area acquiring updating data area in accordance with the judgment, as required by Claims 7/15.

The patent application publication to Yamagami, et al. (2003/0233518) ("Yamagami") discloses a method for managing replication volumes in which mirror volumes are created from a volume pool by specifying arguments which may include performance and reliability indications. Mirror volumes are user-selected.

Yamagami, however, does not disclose retrieval of a data area capable of configuring the replication destination coincident with properties of a data area corresponding to a policy of the replication source data area from existing data areas, as claimed in Claims 1 and 9. Further, Yamagami does not disclose the generation of a data area of a replication destination in accordance with information of a data area of a

replication source when the data area of the replication
destination different from the data area of the replication
source is set with the data area being the data area of the
replication source, selection of the data area of the
replication destination in accordance with information of the
data area of the replication source, or management of the data
area of the replication destination as the replication
destination of the data area of replication source, as
required by Claims 3, 11, and 17.

In addition, Yamagami does not disclose a program/method
that acquires information of a route for connecting a storage
having the first data area (of a replication source) and a
storage having the second data area (of a replication
destination) when replication is operated with one data area
as the first data area and another data area as the second
data area, confirms information of the route when write occurs
to the first data area, confirms information of the route in
response to a replication start request from the first data
area to the second data area, and judges whether connection of
the route for connecting the first data area to the second
data area is made through a different route in response to
information of the first data area and information of a line,
as required by Claims 6/14. Further, Yamagami does not

disclose a program that gives the storage and instruction of replication of the first data area to the second data area by connecting the different route, as required by Claim 6, or a method that establishes connection through the different route and makes replication from the first data area to the second data area, as required by Claim 14.

Moreoever, Yamagami does not disclose a program/method that acquires an operation condition of the replication operation when the replication is operated with one of the data areas as the first data area and another data area as the second data area; judges existence/absence of omission of data stored in a storage area in accordance with information of the first data area, the operation condition of the replication, and the operation condition of the storage area; and updates data of the storage area acquiring updating data area in accordance with the judgment, as required by Claims 7/15.
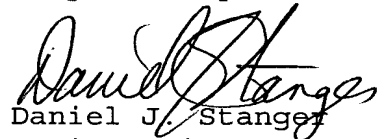
Conclusion

The pre-examination search required by the MPEP "must be directed to the invention as claimed in the application for which special status is requested." MPEP §708.02 (VIII). The search performed in support of this Petition is believed to be reasonable; however, the Applicants make no representation that the search covered <u>every</u> search area that may contain relevant prior art. Prior art of greater relevance to the claims may exist. The Applicants urge the Examiner to conduct his or her own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited above and any other prior art that may be located in the Examiner's independent search.

Further, while the Applicants have identified certain portions of each cited reference in order to satisfy the requirement for a "detailed discussion of the references, which discussion points out, with the particularly required by 37 C.F.R. §1.111(b) and (c), how the claimed subject matter is patentable over the references" (MPEP §708.02(VIII)), the Examiner should not limit review of these documents to the identified portions, but rather is urged to review and consider the entirety of each reference.

In conclusion, the Applicants submit that the foregoing discussion demonstrates the patentability of the claimed invention over the closest known prior art. Accordingly, the requirements of 37 CFR §1.102(d) having been satisfied, the Applicants request that this Petition be granted and that the application be examined according to prescribed procedures.

A Credit Card Payment Form in the amount of $130.00 was submitted with the Petition filed November 12, 2004, in satisfaction of the fee set forth in 37 CFR §1.17(h). It is believed that this Resubmitted Petition does not require an additional fee. However, the Commissioner is hereby to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

Respectfully submitted,

Daniel J. Stanger
Registration No. 32,846
Attorney for Applicants

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 Diagonal Rd., Suite 370
Alexandria, Virginia   22314
(703) 684-1120
Date: May 19, 2005